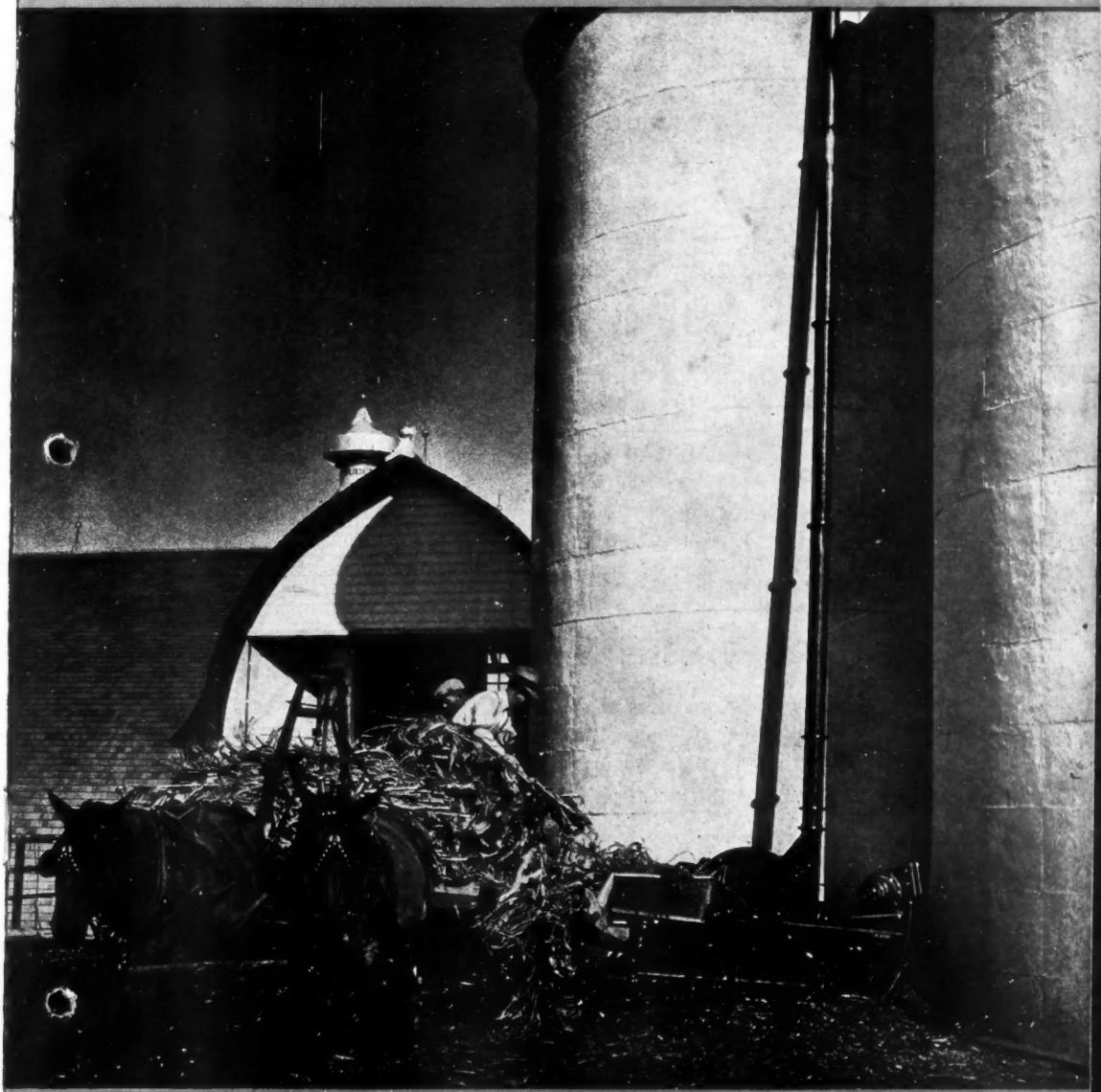
Electricity on the Farm

A MONTHLY MAGAZINE FOR THE UP-TO-DATE RURAL FAMILY



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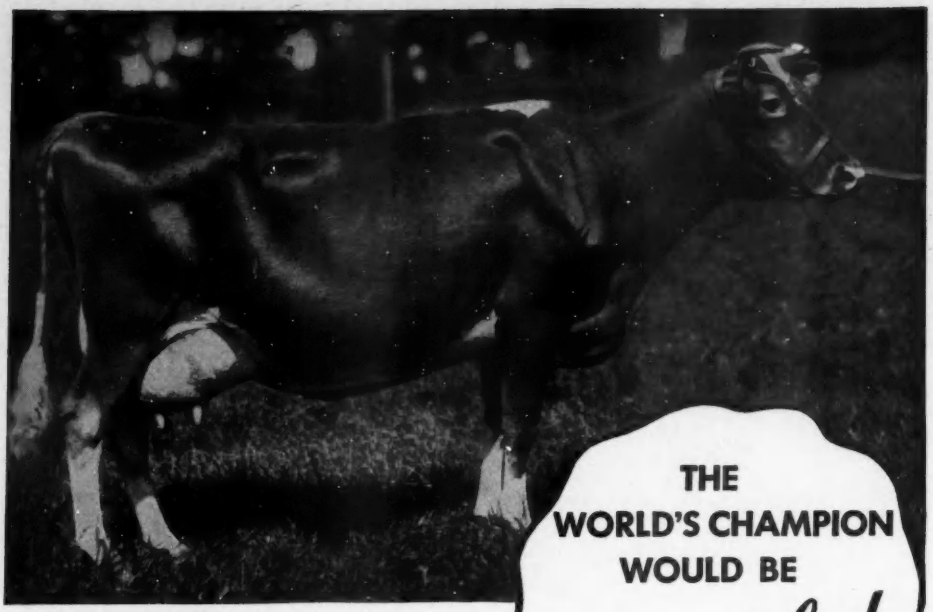
JULY
1935



THE WORLD'S CHAMPION WOULD BE *Out of luck*

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KELVINATOR

July, 1935

Electricity on the Farm

Vol. 8, No. 7

IN THIS ISSUE

Filling the Silo

BY T. E. HIENTON

Farmers who are looking ahead realize that the storage of silage is but a few weeks away and they plan to be prepared for this work. The electric motor will help considerably, regardless of the type of silo used. The trench silo, which recently became very popular, as well as hints on the proper use of silo filling equipment are discussed by the author on page 4.

Hot Weather—Cool Milk

BY H. J. GALLAGHER

Hot weather brings many difficulties to the dairyman who is not properly equipped with refrigeration to keep his product in a condition acceptable to the modern market. And with a view of ending these problems as well as increasing profits for the dairyman, the author presents his story on page 6.

Keeping in Hot Water

BY VERA B. MEACHAM

"Keeping in hot water" for the many uses required of hot water about the farm is a problem which is quickly solved by employing an electric water heater. The author reminds you on page 9 of some of the tasks requiring hot water and also suggests a method of securing an abundant supply on an economical current charge.

Shelling Corn the Modern Way

BY E. W. LEHMANN

Those farmers who have electric service, and who use a good portion of their corn crop for cattle or chicken feed are the ones who know the real value of shelling corn electrically. The electric motor enables them to do such work when it best fits in with their other work, or as the demand warrants, which, according to the author, is very helpful to farmers. See page 11.

Regular Monthly Features

Electrical Housekeeping, page 13; On the Air, page 15; Questions and Answers, page 17; What's New, page 18.

EDITORIAL

The cost of hired help has taken the profit out of many farms. Reducing the amount of hired help without reduction in output is probably the most effective way of increasing farm profits.

A conspicuous example of how many farmers are saving money today is in the operation of silo filling with an electrically driven cutter? Instead of having a custom crew do the work, on many farms today the members of the family alone are able to perform the task.

A load of corn is brought in to the cutter, the motor is switched on and it continues its work without hesitation, and without supervision, until the load has been processed and delivered into the silo. Then the motor is switched off, and the team is headed back to the field for another load.

No tamping of the silage is necessary, for plenty of time is permitted for it to settle naturally.

The cost of the current is negligible; there are no hired hands to pay; there is no crew to feed; and the job is done equally well.

Those farmers filling silos by the electrical method are unanimous in their assertion that it is a highly profitable practice.

THE PUBLISHERS.

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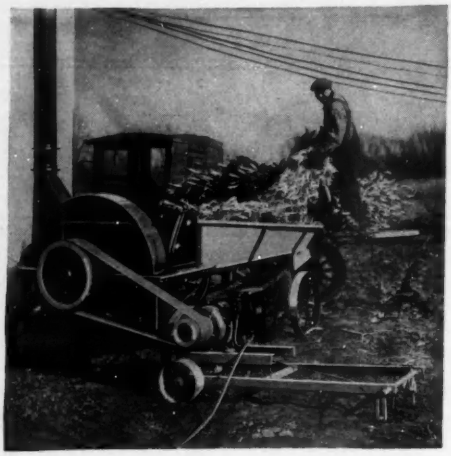
Silo filling with an electric motor can be made a one-man job.



FILLING THE SILO

By T. E. HIENTON

SILOS played an even greater role in handling the corn crop in a large portion of the Corn Belt in 1934. The unprecedented drouth dried up the crop to such an extent that in many fields there were total failures while in others the stalks were so small that no ears were produced. In the latter case silos were employed to aid in conserving the entire corn plant by storing the crop for fall and winter feeding.

The acuteness of the problem forced many farmers who were without silos to hastily construct temporary ones by various methods because of the general feed shortage. These temporary emergency silos were usually of one of two groups, the underground and above ground. Of the underground type, the trench silo was most popular although the pit silo of a temporary construction was employed. In the above ground type, crib or fence silos were used.

Trench Silo Fills Emergency Need

Trench silos proved to be most practical in Indiana where more than 110 were constructed in 1934 according to figures obtained by S. A. Anderson, extension agricultural engineer of Purdue University. He reported that one was in use in 1932 and 33 in 1933, indicating a rapid increase in use of this type, at least for emergency use. Mr. Anderson, working with county agricultural agents in the state, supervised the construction of several trench silos as demonstrations. In addition he prepared a publication on temporary emergency silos. Features of the trench silo which make it very desirable for use as a temporary method of feed conservation were listed as follows:

1. Requires very little, if any, cash outlay. The silo can be constructed with a plow, scraper and spade.
2. Can be constructed anywhere where there is sufficient drainage for a house basement.
3. Its capacity can be varied by merely changing the length of the trench.
4. The filling can be done with an ordinary feed cutter if the blower type of silo filler is not available.
5. It can be filled easily. Silage can be packed with horses, tractor or by men. If corn is dry, water can be added by gravity flow.

Portable farm motor operating ensilage cutter at farm of George W. White, Mt. Vista, Md.

6. No roof is essential. Cut straw, chaff or soil can be used to seal the silo.
7. It will not blow or burn down.
8. It can be made into a permanent structure at any time by lining the walls and providing a removable roof.
9. When carefully constructed and properly filled it will make as good silage as any silo.

When Trench Silo Is Desirable

The advisability of employing a trench silo for permanent use will depend upon a number of factors such as distance from the farm or feeding lot where silage is to be fed, type of soil in which it is built and extent of use. In many cases the first cost of a masonry or wood silo has prevented the use of a silo by the owner of a small herd of cows. The first cost of a trench silo is low enough to eliminate this problem for, according to an estimate by agricultural engineers of Alabama Polytechnic Institute, the cost of digging a 50-ton silo is from $20 to $25 where a reasonable charge is made for man and horse or mule labor. The actual cost for constructing this type of silo may not require any cash outlay.

Trench silos may be filled with the common silage cutter but since they are usually located below the machine a feed cutter without fan or other device for elevating may be used. Mr. E. G. Diseker of Alabama Polytechnic Institute reports results of his tests with "An inexpensive machine for filling the trench silo" in Circular 61 of the Agricultural Experiment Station of that institution. The capacity of the cutter was listed at 3.21 tons per hour when it was driven by a 5-horsepower electric motor. This is about half the capacity of the usual silage cutter when operated by that size of electric motor.

Motor Operating Advice

The practicability of driving a silage cutter with 5 or 7½-horsepower motor to fill the silo has been well established. A representative of a well-known manufacturer of silage cutters estimates that from 1,000 to 2,000 such machines will be driven in 1935 by electric motors. Many of these cutters may be operated by men for the first time so that several points which should be considered when using an electric motor for this power job will be enumerated here even though they have probably all been mentioned in previous articles in this magazine.

First, an electric motor may be expected to deliver steadily the horsepower at which it is rated. Motors will deliver considerably more than their rated power but should not be operated continuously at an overload. The ability of the motor to carry a heavy temporary overload is the reason why motors of these sizes can operate silage cutters satisfactorily when proper voltage is maintained at their terminals. Farmers expecting to use motors for this purpose should check with their power companies in necessary wires from transformer to motor. Motors should be equipped with overload devices which prevent them from being seriously overloaded.

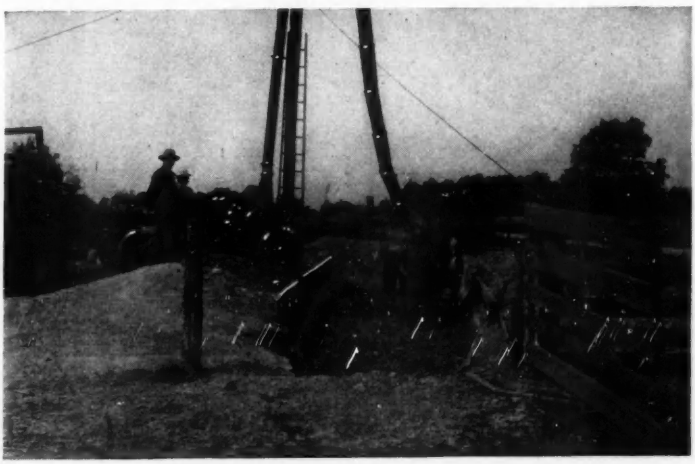
Change and Sharpen Knives Regularly

Second, knives should be sharpened regularly and changed every half day or for every 30 tons cut. These should be set as close to the shear plate as possible without striking it. The shear plate should be sharp on the cutting edge, it may need only to be reversed to provide the sharp edge if one has become rounded.

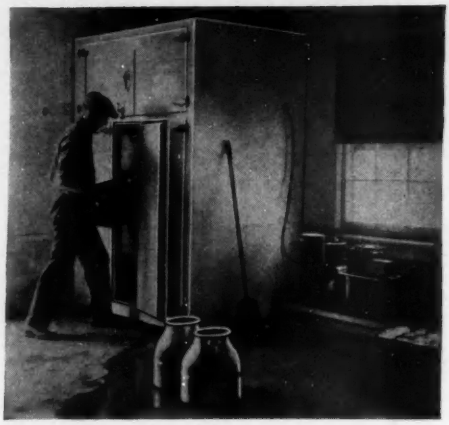
Third, tips of the fans should run within ⅛ inch of the lower casing.

Fourth, the cutter should be fed evenly, ordinarily medium-sized bundles of heavy corn may be lapped to the band of the preceding one, but one should not be placed on top of the other where a 5-horsepower motor is used.

Fifth, speed of new cutters will usually be not more than 400 revolutions per minute and may be less. Older models of cutters may have to be run at higher speeds since some of them were designed for operation in excess of those mentioned. A table, from which the proper speed for a good cutter may be determined, appeared in the July issues of this Magazine in 1932 and 1934. Similar tables are available in most instances from agricultural engineering departments of state agricultural colleges, representatives of silage cutter manufacturers and rural service men of local power companies.



A trench silo on the Speakman farm, Adams County, Indiana, during filling in Sept. 1934.



HOT WEATHER—

By H. J. GALLAGHER

A safe place for the storage of bottled milk is this electrically cooled refrigerator on the Christ Brothers farm at Clinton, N. J.

FARM electrification has developed in the United States to the extent that at the end of 1934 there were 743,954 farms receiving high line electric service. This number of farms represents 11.8 per cent of the total farms in the country. The results of electric operation even on an 11.8 per cent basis is already changing many of the old established practices of agriculture. The dairy industry, the poultry industry, market gardening, and other divisions of farming, are conducted quite differently in electrified communities than in communities that do not have electric service.

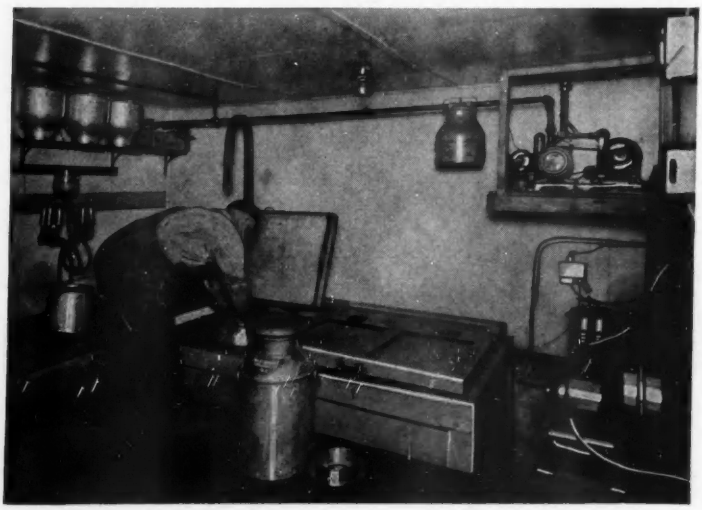
The farmers who are in a position to use electricity have gained an advantage over their competitors who have to depend upon more laborious or more costly methods of producing quality products. In this age of keen competition no advantage should be ignored, each factor of production should be carefully analyzed either from the viewpoint of maintaining the present market or expanding the business.

It is safe to assume that on the large majority of the 743,954 farms having electricity, the dairy industry is of importance either from the standpoint of supplying the entire income of the farm or a minor part of the income. In either case a high quality product and efficient operation insure a better return than where ordinary methods are practiced.

One of the essentials in producing pure milk is retarding bacterial growth after the milk is produced. This is best accomplished by properly reducing the temperature of the milk below the point favorable for the growth of bacteria. Merely reducing the temperature of the milk may be of little value. The sooner the temperature is reduced after milking, the rapidity with which it is reduced and the temperature maintained determine the effectiveness of the process.

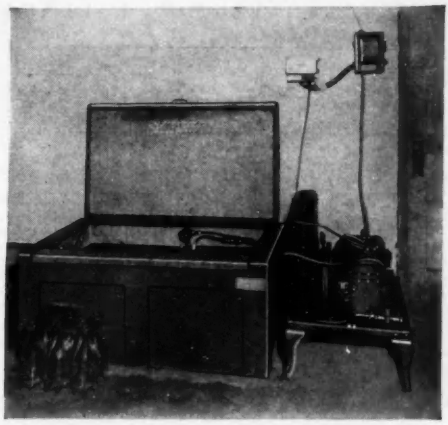
All dairy farmers recognize the importance of cooling. The majority of dairy farmers, however, not including the large commercial operators, have not given cooling processes the study they deserve. The farm milk-cooling system is a vital link in the chain of clean milk from the cow to the consumer.

The commercial dairyman, in order to stay in



Cooling and storage of milk is done with modern electrical equipment on the Kingsley Dairy Farm, Columbus, New Jersey.

COOL MILK



Where milk is stored in large cans, the cabinet type cooler is convienent and economical. The cabinet installation shown here is on the Clark H. Read farm, West Chester, Pa.

business, has rather generally adopted mechanical refrigeration as the most economical and satisfactory method of cooling. The ordinary dairy farmers who actually produce the bulk of the nation's milk in quantities ranging from one to ten gallons upwards daily have taken the cooling problem less seriously. Their general attitude is that every new requirement, legal or otherwise, in the production of clean milk is an infringement on their personal rights as American citizens.

I know what my own reactions were twenty years ago when I started in the dairy business selling whole milk from fifteen cows in ten gallon cans to a local distributor. The first thing I had to do was to remodel the barn, put in a concrete floor, stanchions and more windows. Two years later the city ordinance prohibited the cooling of milk in the stock tank. This was followed by an order to construct a milk house thirty feet from the barn. They even told me the kind of milk strainers to use, how to wash the cows' udders and clip the flanks.

None of these requirements was accepted gracefully, but it was a case of rendering the kind of service an organized community demanded and were paying for, or of dropping the dairy business and starting in something else with another list of requirements that would again shape the individual to the common mould.

Quick Milk Cooling Necessary

The hardest requirement I had to meet became effective in 1922, two years before I left the farm. That was to have the milk at a maximum temperature of 50° F at the time of collection. To do this with a gasoline engine as a power unit and well water as a cooling medium was next to impossible during the warmer weather. To begin with, the water as it left the well was rarely below 50° F. To cool milk from 98° to 50° and maintain the temperature during the night with 50° F water is quite a chore.

One winter I filled an old outbuilding with ice from a small lake a distance of four miles from the farm. I only tried this one year and gave it up in disgust. The ice did cool the water and the cooling process was hastened when the ice was chopped before placing it in the tank, but the general annoyance and the time required in handling the ice was in my estimation out of proportion to the results obtained. I would have more than welcomed modern mechanical refrigeration and electrical pumping.

Of the three methods that can be employed for the cooling of milk on the farm, namely, water, ice and mechanical refrigeration, water is the more generally used because it is essential that every farm have a water supply and some system of pumping and that the only method many farmers can employ is the water method with all of its difficulties and limited application.

The use of ice and mechanical refrigeration are the only means whereby milk can be cooled and stored on farms during warm weather at temperatures low enough to check bacterial growth. Ice is not as extensively used as it should be because of the labor and annoyance of handling and the costs of hauling and storing.

Mechanical refrigeration is the ideal method of cooling and storing milk and other farm products. Not only is it automatic and positive in operation, but it eliminates all of the trouble and labor and many of the costs associated with ice cooling. Unfortunately for most farmers, mechanical refrigeration is largely limited for use on farms where electric service is available.

Mechanical units may be installed to supply wet storage or dry storage. With wet storage, the evaporating or cooling coil is placed in the water in the tank. The wet storage system is less costly to install and requires less power to operate. It is more popular with farmers selling milk and cream in cans than is the dry storage system. Dry storage is better adapted to farms selling bottled milk and other perishable products.

The size of the machine should be determined

*Table I

RANGE OF COOLING TEMPERATURE (°F)	MELTING ICE EQUIVALENT	
	Per Day of Refrigeration Pounds	Per Hour of Compressor Rating Pounds
10	8.4	0.7
20	16.8	1.4
30	25.2	2.1
40	33.6	2.8
50	42.	3.5
60	50.4	4.2

*Table 2—Approximate Power Requirements for an Eight-can Storage Tank Outfit When Used for Cooling and Storing Different Quantities of Milk

Power Requirement Per Day	To Keep Tank Cool	To cool— 4 cans; store 2 cans	8 cans; store 4 cans	10 cans; store 5 cans	12 cans; store 6 cans	16 cans; store 8 cans
	Watt-hours	Watt-hours	Watt-hours	Watt-hours	Watt-hours	Watt-hours
Total	3,627	5,719	7,811	8,857	9,903	11,995
Per can produced	....	1,430	976	886	925	750

The table shows that when cooling 4 cans per day the power required is 1,430 watt-hours per can, and when cooling 16 cans the requirement is but 750 watt-hours per can produced. In other words, if the tank or box purchased is too large, the additional cost of electric current to supply the heat lost through the walls will soon amount to more than the advantage of the extra room.

*Circular 336 United States Department of Agriculture.

by the amount of milk handled. A general tendency is to purchase too small a unit. When the machine is too small it removes the heat less rapidly than desirable and causes the unit to operate too many hours per day.

A good general rule is to install a unit that with approximately twelve hours operation will care for the maximum amount of milk produced daily at any season of the year.

To Determine Compressor Size

The size of the compressor is rated according to its ice melting equivalent.* The proper size can readily be determined by multiplying the figures given in Table 1 under the range of cooling temperature, by the maximum number of ten gallon cans of milk to be cooled. The figures given under refrigeration required per day represent the total amount of ice required to cool ten gallons of milk, while the compressor rating represents the capacity of compressor needed figured on a twelve hour running time per day.

Recently I was discussing the problem of milk cooling with a farmer who lived within one-half mile of a transmission line, but it did not have service. He was seriously contemplating building an ice house primarily for ice to be used in cooling milk. He was selling raw milk from a herd of twelve cows and last summer encountered so many difficulties in maintaining his market that he was forced to improve his methods.

During the discussion we compared the cost of building an ice house with an 8-can size commercial wet storage box; then we compared the cost of filling the ice house and the labor involved in handling ice with the cost of operating the mechanical unit and the labor involved in its operation. To the cost of the mechanical unit was added $400 for securing electric service. The total costs spaced over a ten year period, considering depreciation, upkeep, interest on investment and operating costs, was decidedly in favor of mechanical refrigeration.

A discourse on the same subject with another farmer that had electric service revealed that he was satisfied with the water cooling method. He admitted difficulties but argued that so far he and his neighbors had at least "gotten by." It would be interesting to know how many farmers are satisfied to just "get by," to be guided and controlled by what their neighbors think and what their neighbors do, and also to know the number of farmers who regard farming as a competitive business enterprise, who are capable of analyzing the advantages of new methods, who do unhesitatingly discard the old. In the latter group are

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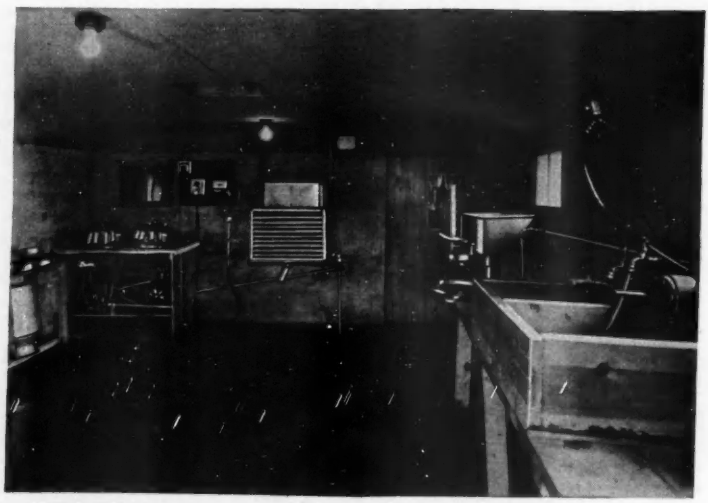
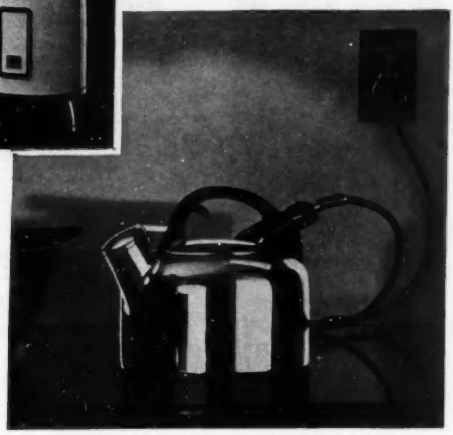


A better return on the high investments in barns and dairy cows is assured through mechanical refrigeration.

Left: An electric water heater fits into a modern kitchen.



Below: This little electric tea kettle heats water in a hurry.

KEEPING IN HOT WATER

By VERA B. MEACHAM

UNLESS you want to drink it, you have to heat most of the water that comes into the house before it is ready for use. Unless you have a water system, you may have to do this in the reservoir of the kitchen stove. Then all the cold water has to be carried and lifted into the reservoir, and all the hot water lifted and carried away again. It costs a lot to get hot water that way. Countless steps, lugging heavy pails, waiting for fires, irritation and muss.

But when water runs from faucets into your sink, the same electric current that carries the water can heat it, too. You can have hot water, a pint or a tankful without all that work.

Hot water for dishes without building any fires, carrying any coal, or carting away any ashes. Hot water for baths with no one running down stairs and poking the fire to heat up the tank. Hot water on wash day without getting up early to heat the water.

And every day and every day plenty of hot water ready to wash and rinse the milk strainers, the milk cans, the pails and the milking machine. All the hot water you need to wash the cream separator. And on cold winter mornings, plenty of hot water at the turn of a faucet to mix a warm mash for the hens or fill their drinking fountains. And Fridays, when you dress the poultry for the market, hot water ready and waiting for the job.

You have to get hot water for these things somehow. You will find it easier to get it electrically.

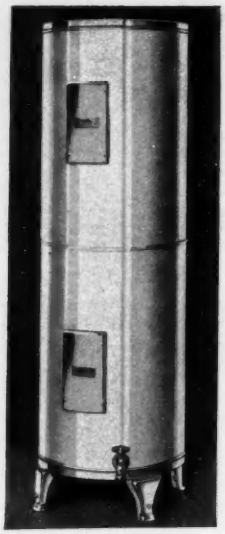
There are several kinds of electric water heaters to choose from. Some of them heat the water before it enters the tank. Some have heating elements fitted inside the tanks. These may be units of large wattage to heat a small amount of water quickly, or they may be smaller units to run a longer time. Either kind can be fully automatic; it can be turned on by hand, or it can be controlled by a timing device like the clock on an electric range.

Because electricity can be managed by remote control, the switch or timer can just as well be in the kitchen or bathroom as down by the tank. When you want hot water, you turn the switch and let it heat. Or with the timing control called a Time-O-Stat, you turn it to run twenty minutes for water for dishes, three quarters of an hour for Jimmy's bath, or some such schedule worked out for yourself when you find out how long it takes to heat the amount you want.

Off-Peak Heaters Becoming Popular

The fully automatic tank heaters with low wattage heating elements are becoming increasingly popular because they can often be used at a very low rate. This is not when they are run at any time like any other appliance, but when they are controlled by a clock that cuts them off when other uses of electricity are heavy. They call these off-peak heaters.

Do you know what the power company men mean when they talk about peak load? Every minute of the day they have a record of the



For heating the water electrically.

amount of current they are supplying. The line on the chart that shows how much electricity is being produced varies more or less throughout the day. But along about dusk, it begins climbing up like a child's picture of a mountain. At nine, maybe later, it begins to drop off sharply, leaving the record of a little mountain peak of heavy use. The company has to have generators and turbines, power houses and lines enough to supply the current needed at the moment of greatest use, at the point recorded by the top of that peak. Then all night long, much of that equipment runs at half load or less, for folks don't use much electricity during the night.

Now water heating is a job that can be accomplished for you while you are asleep. It really does not make any difference to you when the water is heated so long as it is hot when you want it, does it? That is what the power companies have figured out too. So they tell you, many of them, that if you will have your water heater set to operate any time between 9 o'clock at night and 9 in the morning, and from noon until around 4:30 when these power wires are not fully loaded, they will give you a very low rate for heating the water. Of course, that does not mean that the current would be on all that time. It would be on only so much of the time as was necessary to keep the water in the tank at about 150 degrees.

But just in case you might have sudden need for hot water in excess of your normal supply, which they figure carefully for you in planning your installation, these tanks have a second heating element called a booster unit in the top of the tank. If you draw off so much hot water that the temperature drops too far, this booster unit goes into action long enough to heat it up again.

Of course all the tanks for electric water heaters are well insulated so the heat loss through the wall is small. Even when the water inside the tank is hot, the outside is barely warm. That saves current of course, and it makes the heater a comfortable thing to live with right in the kitchen. And often the kitchen is the best place to put an electric water heater, because water is drawn most frequently and in small quantities at the kitchen sink. Having a short distance to travel here will cut down on heat losses.

There is no reason why it should not stand in the kitchen because it can be put anywhere. It does not need attention or adjustment, so you do not have to leave room to work around it. There is no flame, it needs no draft or flue to carry away the fumes. It takes no fuel, so there is nothing greasy or dirty about it. It presents no fire hazard, so it offers no menace to the house.

For a hundred jobs that demand quantities of hot water, these heaters offer a constant, steady supply, so completely automatic that you need never give it a thought; all you have to do is turn a faucet marked H when you want hot water.

But sometimes you want it boiling. Electricity can take care of that, too. Here is a beautiful new tea kettle with a 1150 watt heating element inside. You cover that heating unit with water when you fill the kettle through its short wide spout. The cover on the spout flips back when you pull the lever on the handle.

This tea kettle is fast. Pour in a couple of pints of water, plug in the cord, and you will have a quart of boiling water in less than six minutes. Or if you are in a great hurry, set the kettle on the stove. By the time you can get out the coffee maker, lift down the coffee can, and measure four tablespoons of coffee into the pot, the kettle will

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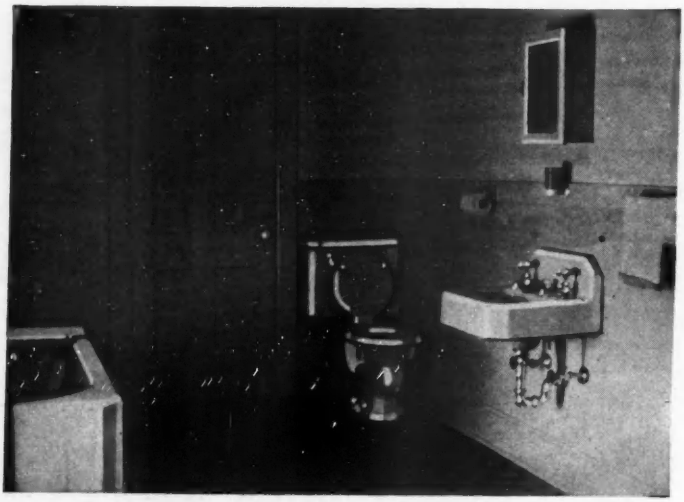
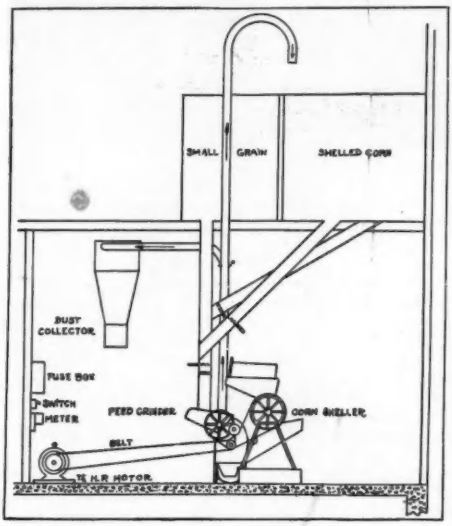


You need lots of water in the bathroom.

SHELLING CORN the Modern Way

By E. W. Lehmann

IN general, farmers who shell corn with small capacity shellers driven by electric motors are those who utilize the corn that is shelled for feed on their own farms. The bulk of the commercial corn that is shelled and sold throughout the corn belt is shelled for market with a custom sheller operated by a tractor. Since only about



Diagrammatic outline of the shelling, grinding and elevating equipment on the Lawrence farm, McLean County, Illinois.

one-eighth of the corn belt farmers are equipped with electric power, the practice of driving large custom shellers with an electric motor is limited. However, the farmer who has electric power and who either feeds shelled corn or grinds his own feed and prepares special rations for poultry or dairy cows will find an electric driven sheller a paying investment.

Robert Chaffee, owner and operator of a 320 acre McLean County farm in Illinois, shelled 3400 bushels, his entire corn crop last year, for the livestock he fed on his farm. He now has 100 head of cattle, 50 of which have been on feed for a year. He makes a practice of feeding shelled corn and silage in the winter and shelled corn supplemented by pasture in the summer.

A stationary sheller of the cylinder type with a capacity of 80 to 90 bushels an hour is used by Mr. Chaffee. This sheller is driven with a 5 H. P. electric motor located in the driveway of the granary. This granary is composed of a double crib with bins for small grain overhead, with an inside elevator which is also operated by the same motor. Since Mr. Chaffee uses considerable electricity on his farm, he figures that the electric rate earned makes electric power considerably cheaper than gas engine or tractor.

Mr. Chaffee believes that his sheller is one of the most useful pieces of equipment that he has on his farm. He considers it worth a good deal to be able to shell his corn as he needs it. On a rainy day he can shell several loads and have it on hand for future use. The normal practice on the Chaffee farm is for his boys to scoop the ear corn into the sheller and the shelled corn is then scooped into a wagon. Mr. Chaffee stated that when he is a little short of help he arranges to use the elevator. The shelled corn is then allowed to run directly into the elevator hopper and is elevated to an overhead bin or elevated into the wagon if it is to be used some distance from the crib.

Another corn belt farmer, E. D. Lawrence, also of McLean County, has found the electric motor of special advantage in shelling and grinding the corn for feed. "Convenience more than reduced cost is the big thing with me," says Mr. Lawrence. He further states, "To fuss with a tractor in any and all kinds of stormy weather and to handle a big batch of feed into and away from the grinder is the old way. Now with electric driven equipment the only handling is into the elevator; from there on everything is automatic, both the feeding of the mill and the putting of the ground feed into the bin."

Mr. Lawrence's feed processing equipment includes a cylinder sheller driven by a 7½ H. P. motor. The grinder and the sheller are installed

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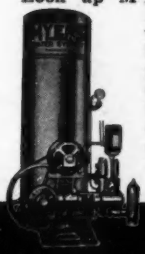

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MYERS WATER SYSTEMS

on the lower floor of the feed barn with three bins overhead in the mow about 20 feet from the mill. As the ear corn is shelled, it is elevated into the bin above. In the process of grinding it is fed down into the grinder by gravity; the operation being entirely automatic after the ear corn is scooped from the wagon into the sheller. The small grain is scooped directly into the elevating hopper. The accompanying drawing and photograph illustrate very clearly the completeness and simplicity of the installation.

While many farmers make a practice of grinding ear corn for feed, Mr. Lawrence not only recognizes that to grind ear corn requires a larger power unit, but also recognizes that corn cobs have little feed value. These two conclusions prompted the installation of the small sheller to be used in connection with his feed preparation equipment. The corn is shelled at the rate of about 85 bushels an hour and the labor required after scooping it from the wagon is practically eliminated.

In the dairy and poultry producing areas of the state the possibilities of using an electric operated corn sheller are greater than in the corn belt area. This is due to a greater need of such equipment and to the fact that a larger percentage of the farmers have electric power.

John Brumbach, a tenant farmer, who operates a 160 acre dairy farm in Boone County, Illinois, shelled and ground approximately 1000 bushels of corn last year which was fed largely to his dairy cows. The total electric power required to shell this amount of corn was approximately 50 kilowatt hours of energy according to the rural electric engineer who works in the area. This is in agreement with results secured in tests at different state experiment stations. A cylinder sheller driven by a 7½ H. P. motor is located in the corn crib which is provided with overhead bins similar to the Lawrence installation. Due to the fact that the sheller is small, he has no difficulty in moving it about the crib. The motor is also on skids and is convenient for moving.

Corn shelling, feeding, grinding and elevating installation on the E. D. Lawrence farm.

The usual practice on the Brumbach farm is to shell enough corn at each shelling to last for a period of two weeks. Mr. Brumbach emphasized the following advantages of shelling corn and not grinding it cob and all, the more common practice. He stated that the calves could be fed the same ration that is being fed to the cows and that they did better than when there were cobs in the ration. He found that for maximum production the cows would eat the grain better when there were no cobs in it. It is of particular interest that the cost for electricity for shelling and grinding is less than when the corn is ground cob and all. Not only is there less energy required but less time is required for grinding when the corn is shelled.

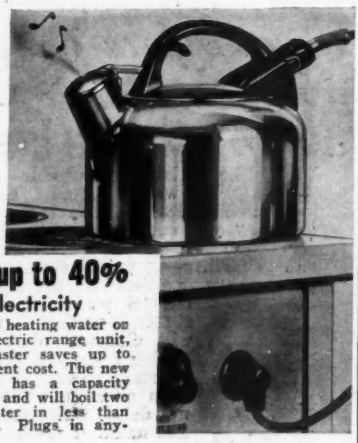
Mr. Brumbach also pointed out that it was a particular advantage to be able to shell corn when it was needed, which could be done with the equipment he has. It should not be overlooked that the cobs were not wasted, but were placed in the cellar and used for fuel, a fact which appealed to Mr. Brumbach.

The principal disadvantage of Mr. Brumbach's shelling outfit is that it does not have any cleaning apparatus and the dust in the shelled corn is considered objectionable for feeding horses. In actual operation it was found that the narrow feed hopper did not permit the corn to be easily scooped into it.

Mr. W. A. Updike, poultry farmer in the same county, has also made good use of an electric

(*Continued on page* 16)

Speedmaster ELECTRIC TEA KETTLE



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Handy and convenient any time of the day or night—for the many daily uses in every farm home. Whistles when water boils—another economy feature—no wasted current. Now you can heat water electrically as fast as with gas. The immersion type heating unit of the Speedmaster is fast, efficient and saves electricity!

See your power company or electrical dealer. If they cannot supply you, write us direct. Price with heavy rubber cord $7.50 postpaid.

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ELECTRICAL HOUSEKEEPING

Conducted by GAIL MEREDITH

AUNT LIZZIE ALWAYS DID IT

A FEW weeks ago when I stopped in at my neighbor's across the road, I found her defrosting her new electric refrigerator. The milk, the butter, a tray of meat, and little covered

Raw meat should be left uncovered or covered very loosely with waxed paper.

dishes of this and that were piled on the kitchen table.

"Just wait a minute while I finish wiping out the chilling unit," she said. "Then we can go out on the porch and sit down."

"Oh, no," I said, "do go on and put the food back in the refrigerator. I'll just sit here and chat with you."

"Why, I can't put it in back now," she answered in horrified protest. "I've got to leave these doors open for twenty-four hours. I've just defrosted it."

I could scarcely believe my ears.

"Why on earth do you do that?"

"I don't really know," she admitted, "but Aunt Lizzie always did it that way."

It was only a few nights later that we were over there for supper. She put a delicious, delicately brown cheese souffle on the table and then went back into the kitchen. As we waited for her we heard the water running at the sink. Our glasses were filled and I wondered what could be delaying her, for souffles, as you very well know, do not brook delay with very good grace.

"Come on, Beth," her husband urged impatiently.

"Now, you just wait, Ed," she called back. "If I don't fill these ice trays and get them back in the refrigerator, I'll freeze my milk and all the other things in it."

It was impolite of us, but we really could not restrain a shout of laughter. As she came through the dining room door, she looked at us in hurt surprise.

"Well," she urged defensively, "Aunt Lizzie said it would."

After we had eaten the souffle, we persuaded her to get the recipe book she got with her refrigerator and read the directions the manufacturer gave for defrosting. We pointed out the paragraph that assured her that the temperature of the box would not rise enough to endanger her food while the defrosting was going on.

As for freezing the food in the box if she didn't have water in the ice cube trays to absorb the cold, that was impossible. The mechanism that produces the cold is designed to freeze liquids or foods put in the freezing unit and to maintain a constant cold—set at various temperatures to be sure, but always well above freezing and always below 50 degrees throughout the storage chamber. Even if she never froze an ice cube, the temperature of the box would not change.

Just in case somebody else has an Aunt Lizzie who has been helping her get started the wrong way in taking care of an electric refrigerator, it may be wise to set down the rules for its care. They are simple and definite.

Keep it clean.

Store foods properly.

Defrost regularly.

Keeping it clean is an easy matter because the food compartments are lined with seamless porcelain that can be washed off easily, every inch of it, with soda or borax in lukewarm water. In many refrigerators the chilling unit, too, can be wiped off like the rest.

The shelves need an occasional thorough washing with hot, soapy water because sometimes the things

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You can keep foods covered in these well designed refrigerator dishes.

we spill elude the prompt wiping up we should give them. The ice trays, too, should be washed and rinsed thoroughly before they are refilled.

To have all of your food chamber evenly cold, you must have a continuous passage of cold air from the chilling unit through the compartment and back again to the chilling unit. Obviously, the space in the path of the air coming from the chiller is going to be a little colder than that near the end of that path when the air has passed through the chamber and in chilling the food has taken up warmth.

To store your foods properly you take account of this slight difference in temperature and put the most perishable foods, milk, eggs, and meat in the coldest spot; less perishable midway, and fruits and vegetables on the shelf where the air current passes over them last on its way back to the chilling unit.

Besides that it means not crowding the containers, but leaving room for the air to pass over them freely.

Most foods keep better in covered containers because the cold air passing over them takes up a little moisture with the warmth. Raw meats should be left uncovered. Covering the food keeps the food odors shut in too.

The more moisture there is for the traveling air currents to pick up, the more will be deposited as frost on the chilling unit, and the more frost there is, the longer the motor will have to work to keep the box cold. This increases the current it takes to run it.

If you keep drinking water or fruit juices in the refrigerator, keep them in covered bottles.

There is nothing else to do but defrost it now and then. That may sound indefinite, but it really means whenever the frost gets from ¼ to ½ inch thick.

You had better keep the directions for your own machine handy until you learn just how to do this. On many of the new refrigerators there is a defrosting switch that defrosts the unit with no attention on your part. Mine has one, but I like to get the job done in a hurry so I act as though it were not there.

I turn the current off. Take out the ice cube trays and empty the ice cubes. Then I fill the trays with hot water and put them back in the freezer. Once in a great while I fill those trays twice, but seldom, because I do not let the ice get very thick. It just drops off. I empty the water, wash and wipe off the chiller, and fill the trays with cold water for ice cubes. Then I turn the current on again.

Ample room on these shelves for the air to circulate freely.

That is all there is to it. I can do it while I am washing the dishes.

But I want to impress on you that you let the ice melt off. You don't pry it off. Not if you are wise. I know a woman who did that with an ice pick she might better have discarded when she sold her old ice box. Anyhow she poked a hole right through the metal of the freezing unit which was very, very hard on her husband. He had to buy her a new refrigerator.

I will admit, though, that she never claimed that "Aunt Lizzie always did it that way."

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ELECTRIC MOWER

Both cuts and trims with scarcely a fringe left along the walk or around the trees or shrubs.

Blade has four cutting edges—easily adjusted—easily sharpened.

Guards on four sides to protect trees and shrubs and a safety guard to protect operator.

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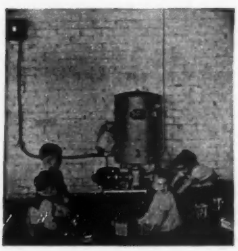

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ON THE AIR

Conducted by JEROME J. HENRY

Kate Smith Being Heard in Evening

ONE of the most popular daytime radio programs, Kate Smith's matinee hour, has moved to Thursday evening at 8:00 p.m., Eastern daylight saving time.

The program started last September. Since then

Dizzy Dean and the great right arm that means so much to the Cardinals. Here he's doing a bit of clowning with Kate Smith during a broadcast in which he was the guest star on her program.

Kate Smith and the other artists on the program have developed it into one of the most interesting and entertaining on the air.

Each week Kate interviews a champion of one kind or another. Her guests have included outstanding performers in many sports, including puzzle-solving and even wood chopping.

Kate takes care of the musical part of the programs herself. Musical variety is given the program by the Three Ambassadors, Wallace Sisters, and Jack Miller's orchestra.

• • •

Broadcasts from California and New York Same Day

HOW fast we can travel these days was shown recently when Benay Venuta sang three times over CBS stations on the same day, once from California, once from Ohio, and once from New York.

She opened the network at 7:30 a.m., singing from Hollywood, California. She sang from Cincinnati early in the evening, and then she closed the network for the night from Broadway in New York.

Pilot Andrews, who set a transcontinental speed record some months ago in a transport plane flew her across the continent in the maiden trip for a new giant Douglas plane.

Of course Benay lost no time. She sang in Ohio while the plane took on fuel. At the Newark airport she was met by a special car and escorted by the police to the scene of her closing broadcast for the day.

The adventure accords with the character and personality of Benay Venuta. Next to singing she loves to fly. She is an adventuresome person and has been in danger of losing her life at sea three times. A native Californian, she was educated in Europe. In her school days she was active in amateur theatricals. Just a few months ago she came to New York and within a few days had established herself as a favorite songstress.

• • •

The Mail Man Carries a Heavy Load

THE mailman rings several thousand times a day where CBS artists receive their mail. Often what he brings outgrows the classification of mail and becomes plain freight. A casual inventory taken one day recently uncovered a mail-bagful of information.

Alexander Wollcott's mail has been written on everything from an old collar to the finest, and perfumed, stationery. His represents a cross-section of all fan letter writers, from the poorest to the most aristocratic.

Bing Crosby and Annette Hanshaw lend an international twist to the far mail situation. They receive a great deal of mail from Canada. Eddie Cantor has gone even more international.

Andre Baruch recently received a very pretty cage containing an alligator. In no less a fix were Burns and Allen when they were handed a crate of apples by Uncle Sam. These were distributed among the boys in the main room at the studios.

Kate Smith probably receives the greatest vari-

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Now you can use the world's cheapest, most effective livestock fence. This Prime Controller, plugged into 110 a.c. or 32 d.c. light socket gives barb wire a harmless kick. Livestock won't go over or under it. Four years' experience proves it.

Proved Absolutely SAFE

Don't try to use electric fence unless you use the PRIME CONTROLLER. It is the one, proved absolutely safe way to electrify fence. One controller operates 4 miles of Electric Fence for 10c per month. Positively harmless—stings stock, gets their "goat," but cannot hurt them. This means you can have all the fence you want at 4c per rod. Easy to put up—fence in part of a field or pasture for hogging down corn, rotating pasture, etc. Saves cost on first field you fence.

SAVE 10 TIMES Its Cost In One Year

Save wire. Save posts, use stakes. No gates, use snap. 30 days' trial at our risk—satisfaction guaranteed or money back. Write

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ety of mail. She has received lucky charms, cookies and cakes, flowers and dolls, and a sewing kit among other things. People hoping for auditions have sent her recordings of their voices and everyone named Smith, it seems, tries to establish some relationship.

Because of the habit of many artists of calling for their mail at the mail room, the place has become a rendezvous for artists. Every time a new artist appears on the CBS network there is sure to be a letter of frank criticism from one who never fails to applaud—or boo—newcomers to the microphone. The mail room boys are so familiar with mail that they can nearly always tell what it contains. They give full credit to the Post Office, however. Mail has reached its destination no matter how misspelled the name, how wrong the address, how distorted the face of the envelope.

Shelling Corn the Modern Way

(*Continued from page* 12)

driven corn sheller on his farm. Mr. Updike farms 120 acres and keeps from 1000 to 1500 laying hens. With the exception of two cows all of the feed grown on this farm is fed to the chickens.

A two-hole picker type sheller is used, driven by a ¾ H. P. electric motor mounted on top of it. The capacity of the sheller is approximately 15 bushels an hour. The 3-4 H. P. motor has adeq uate power to operate the sheller. On this farm the corn is shelled and ground on the first floor of the feed room and is elevated to the second floor where all of the grain and concentrate are mixed together before grinding. One of the big advantages of the equipment as arranged is that the sheller and motor are all in one unit and can be moved easily from one crib to another when it is found desirable to shell the corn at the crib.

A ¼ H. P. motor will easily operate an ordinary one-hole hand power sheller of the picker type. Such a sheller is a valuable addition to the equipment on a small poultry farm. A sheller of somewhat greater capacity, such as Mr. Updike's, should be considered where a larger amount of feed is to be used.

The cylinder type and the spring or picker type shellers mentioned in this article are the two types of shellers available on the market at the present time. Most of the very small shellers are the spring type. The large shellers used in custom work are more often the cylinder type. These large shellers require considerable power. There are now several small cylinder shellers on the market such as mentioned; they are driven by either a 3 H. P. or a 5 H. P. motor. The capacity of such shellers is approximately 100 bushels an hour.

Keeping in Hot Water

(*Continued from page* 10)

be whistling in your ear that the water is on the boil.

That is one very, very nice thing about this tea

The hot water at the sink is carried to the washing machine too, through a short length of rubber hose.

kettle. You can use it as an electric tea kettle; you can leave off the cord and use it on the stove like any other kettle, or you can plug in the cord and set it on the stove, too.

Isn't that convenient for getting shaving water in a hurry, for water to warm the baby's food, or for a sudden emergency supply? And when you need boiling water for cereals, for coffee, for tea or cocoa, when you need it for baking, this is a quick and efficient way to get it.

If you want to keep yourself in hot water all the time, electricity will be a great help to you, a pint or a tankful, remember.

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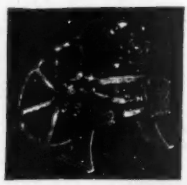

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EVERITE PUMP & MFG. COMPANY, Lancaster, Pa.

Questions and Answers

Conducted by H. J. GALLAGHER

Circuit Wiring

Question: *I want to install a circuit in a sun parlor, consisting of five convenience outlets, one switch and a ceiling light. In going from one convenience outlet box to another, can the wires be soldered together in the box or can two wires be fastened under the one screw?*

A. KOSELA,
Calumet, Mich.

Answer: The best way to continue service from one convenience outlet box to another is to use duplex convenience outlets with four binding posts, two on each side. On one side of the outlet the two brass screws are for the dark or hot wire, the two screws with aluminum finish are for the ground or light colored wires. With the ordinary convenience outlet with only two binding posts, it is better to use only one wire under the screw and solder the wires together, insulate and tape to continue the circuit. Two wires under one screw do not work so good.

From the last convenience outlet box go to the switch box, and from the switch box go to the light. In the switch box joint solder and tape the ground wires together and connect the switch in the hot wire. Never connect a switch in the ground side of a circuit. The final job is to connect the hot wire to a fused block in the distribution cabinet and neutral wire to the ground.

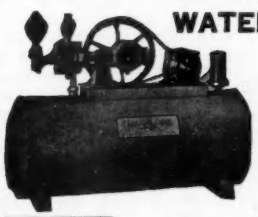
There should be no splices in the cable between boxes and the cable should be securely fastened to each box.

Single and Three Phase Service

Question: *I have 3 wire service, but can only use 2 wires to run motors. I know of other places that have 3 wire service that run motors on 3 wires. Why can't all motors be run on 3 wires with 3 wire service?*

T. R. M.

Answer: Practically all farm service is single phase service with 3 wires from the transformer to the meter and distribution. Single phase service is only used with a 2 wire circuit. The two out-



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FOR THE HOUSEHOLD

Ranges—Refrigerators (*see advt., Inside Front Cover and page* 17)—Clothes Washers—Vacuum Cleaners—Ironing Machines—Dishwashers—Flat Irons—Food Preparing Machines—Ice Cream Freezers—Sewing Machines—Table Cooking Appliances—Clocks—Range Replacement Units (see advt., page 16)—Floor Polishers—Electric Tea Kettles (*see advt., page* 12).

FOR WATER SUPPLY

Automatic Water Systems (*see advt., pages* 11-13-14-16-17)—Water Heaters—Controls—Septic Tanks.

FOR THE DAIRY

Milking Machines—Milk Coolers (*see advt., Inside Front Cover and page* 17)—Cream Separators—Churn—Bottle Washers—Dairy Sterilizers—Clipping and Grooming Machines.

FOR POULTRY

Incubators—Brooders—Time Switches—Drinking Fountain Warmers—Ultraviolet Light—Thermostats.

FOR REPAIR AND MAINTENANCE

Soldering Irons—Tool Grinders—Drills—Paint Sprayers—Woodworking Machinery—Motors.

MISCELLANEOUS

Feed Grinders—Ensilage Cutters—Corn Shellers—Hay Hoists—Feed Mixers—Stationary Spray Plants (*see advt., page* 11)—Burglar Alarms—Ventilators—Soil Heating Equipment—Insect Traps and Screens—Electric Fencing Units (*see advt., page* 15)—Radio Sets—Sheep Shearing—Light for Stimulating Plant Growth—Floodlights—Bunch Tyer—Vegetable Washer—Motors—Electric Lawn Mowers (*see advt., page* 14).

▼

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Without cost to me, please have manufacturers send complete information on the following Electrically Operated Equipment which I am thinking of buying.

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....

My name is .....

Address .....

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I get electricity from .....

..... 7-35

side wires give 220 volt service for power, and the center wire and either of the outside wires give 110 volt service for lighting and household operation.

In some cases where the demand justifies the additional expense, three phase service is used and with three phase service three wires operate the motors on 440 volt service. Where three phase service is used for power, single phase service is also used for lighting and consequently it is necessary to install two separate systems which is entirely too costly for general farm operation. The additional expense of single phase motors over three phase motors is a minor detail as compared to the investment for three phase service.

Motor Conversion

Question: *I have a ½ H. P. 440 volt 3 phase motor that I would like to convert into a 110 volt single phase motor. What must be done?*

P. S. Burnham,
East Hartford, Conn.

Answer: There are so many fundamental differences between a 3 phase motor and a single phase motor that it would be out of the question from a practical standpoint to convert one to the other.

A single phase motor is considerably larger than a 3 phase motor of the same power rating. It has one single winding on the field whereas the 3 phase motor has three separate field windings laid in the slots of the stator. On single phase motors it is necessary to have some kind of a self-starting device. That is why the rotor of the repulsion-induction motor consists of a complicated armature and a commutator together with a brush ring and carbon brushes.

The 3 phase motor is more simple in construction. No self-starting mechanism is necessary and the rotor may be merely metal bars short circuited at both ends and attached to a shaft.

The best solution of your problem is to sell the 3 phase motor and buy a repulsion-induction single phase motor. It might be possible to trade the 3 phase motor toward a single phase motor at some motor shop.

Three phase motors are almost exclusively used industrially and many farmers have purchased 3 phase motors as bargain motors to learn later that they would not operate on single phase service.

Hot Weather — Cool Milk

(*Continued from page* 8)

the blazers of new trails. They actually establish the methods that are later and less profitably followed by all farmers.

So it is with electric energy on some of the 743,954 farms now having service. Electricity is paying big dividends by uses that other farmers continue to ignore. Each year as the high lines extend and more farms are connected, the present advantage open to but 11.8 per cent of the farms of the nation will become less pronounced as a more average condition is appproached. This does not mean that electric service will be less valuable in the future than at present, in fact it is destined to increase in value and many of the voluntary electric practices of today may be compulsory practices of the future. The nationally known slogan of "Eventually, why not now?", might well be applied to electric operation.

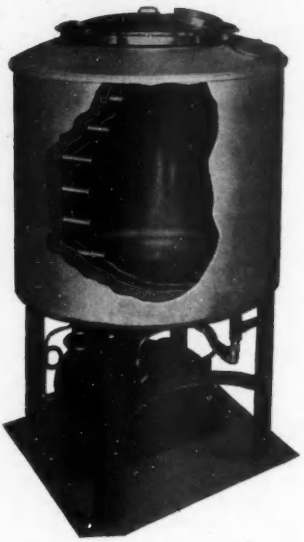
What's New

Reviewed by T. E. HIENTON

Names and addresses of manufacturers of the articles described in this column will gladly be furnished upon request. Address your requests to What's New Department, Electricity on the Farm, *24 West 40th Street, New York, N. Y.*

Glass-Lined Milk Cooler

Production of quality milk demands proper cooling to prevent rapid bacterial growth. Electrically refrigerated milk coolers are proving to be the answer to the problem of proper cooling to aid in high quality products.



A glass-lined farm milk cooler has recently been announced by a manufacturer of glass-lined steel equipment. This machine produced originally only in a 60-gallon size is to be offered in units of 40, 80, 100 and 120-gallon capacity. The refrigerator coil and water bath are contained in a welded steel jacket lined on the inside with glass. Cork insulation surrounds the jacket which, in turn, is enclosed by welded steel insulation sheathing with paint finish. An automatic electrical refrigerating unit, driven by a 1/3-horsepower motor, is mounted on a solid steel base. Milk is poured into the cooler through a 5-inch can dump strainer opening located in a polished metal removable cover. A sloping bottom aids in quickly emptying the milk into cans prior to shipment. Inspection of the refrigerator coil, expansion valve and water bath level is possible by means of an inspection cover.

Never Fails

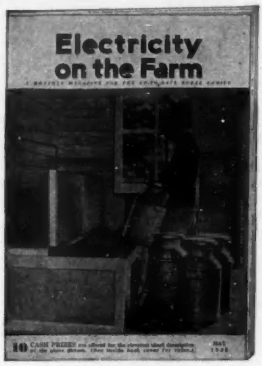
The way to distinguish between weeds and plants in the garden: Cut them all down. Those that come up again are weeds.

Applause to the Echo

"Be kind to insects," says a writer.
We never lose an opportunity of patting a mosquito on the back.

—The Humorist (London).

COVER TITLE CONTEST



MAY COVER

RULES
JULY TITLE CONTEST

Ten cash prizes will be awarded for the 10 best titles for the picture on the front cover of this magazine.

The first prize will be $20 cash, and nine second prizes of $2 in cash will be awarded.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

Titles should be brief—the shorter the better—and short slogans will be given preferences over rhymes.

All members of the farm family to whom this magazine was sent may submit titles, but each contestant may submit only one title.

Question "A" must be answered.

Entries must be sent to the Title Editor, ELECTRICITY ON THE FARM, 6 North Michigan Avenue, Chicago, Illinois, before August 1st.

Winning names and titles will be announced in the September issue.

Send your title on the coupon or make out a similar form on a plain sheet of paper or government postcard.

$20 First Prize for May Cover

"The electrical way of taking the 'act' out of bacteria."

PARKER GREENE,
R.F.D. 1, Monmouth Junction, N. J.

Nine $2.00 Prizes for May

"The electric milk cooler lowers the bacteria count.
It's the farmer's treasure chest, 'cause milk checks mount."

SUSAN L. BROWN, R.F.D. 1, Walden, N. Y.

"The electric cooler — reduces bacteria in the milk, increases money in the pocket."

MRS. FRANK SANDFOS, R.F.D. 1, Valley Park, Mo.

"Storing milk the electric way
Keeps it fresh throughout the day."

R. B. PARKER, R.F.D. 2, Box 48, Portsmouth, Va.

"Electric milk cooler checks bacteria and increases pay checks."

MRS. WARREN J. VAN WAGONER, R.F.D. 1, Titusville, N. J.

"Electric cooling, no ice—
Less work, better price."

MRS. LESLIE BURT, R.F.D. 2, Wyoming, N. Y.

"An electrical guarantee of low bacteria."

JACOB HOFFEDITZ, R.F.D. 1, Mercersburg, Pa.

"No need now to fear the heat,
The electric cooler keeps the milk sweet."

NAOMI KLOUSER, Hegins, Pa.

"For quickly removing animal heat
Electric cooling can't be beat."

MARGARET C. JONES, R.F.D. 1, Powell, Ohio.

"A cold silent partner, but it keeps things sweet for him."

MRS. ELLA EBERLY, R.F.D. 1, Lawton, Iowa.

My title for the Front Cover picture on ELECTRICITY ON THE FARM for July is

.....

.....

(a) What magazines besides ELECTRICITY ON THE FARM are read regularly by your family? .....

.....

.....

.....

My name is .....***R.F.D.*** .....

Post Office .....***County*** ..... ***State*** **7-35**

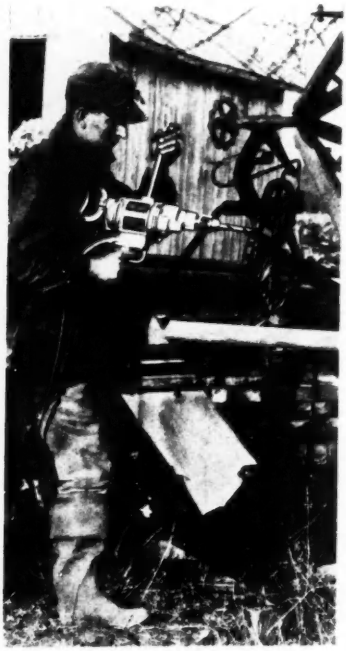
Motor-ize

with a

¼ Horse Power

portable

FARM MOTOR



"No need for breakdowns to cause delays and expensive repair bills when electric power is available!

THOUSANDS of Pennsylvania farmers are using a ¼ H.P. Portable Farm Motor for many of the farm chores that they previously did by hand. They find that it actually supplies an extra pair of hands.

The grinding of tools, for instance, can be accomplished much more quickly and efficiently when a small motor turns the grindstone. And because the motor is portable, it is readily available for use anywhere.

It's surprising how many devices a ¼ H.P. motor can operate. Here are some of them:

Band Saw	Small Corn Sheller
Battery Charger	Drill Press
Churn	Egg Tray Cleaner
Fanning Mill	Ice Cream Freezer
Small Feed Grinder	Milk Bottle Washer
Fruit Grader	Sausage Grinder
Fruit Washer	Tool Grinder
Green Feed Chopper	Tool Polisher

For Complete Information — See

YOUR ELECTRICAL DEALER

or, Agricultural Service Section — WEST PENN POWER COMPANY

201—s

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